Accelerating Infrastructure Innovations

FOCUS

A Special FOCUS on Bridge Technology

December 2003

INSIDE

Safety, Security, Reliability, and Efficiency: Working Together for Better Bridges and Tunnels

By M. Myint Lwin

Improving transportation for a strong America. That's the vision of the Federal Highway Administration (FHWA). In support of this vision, FHWA's Office of Bridge Technology is dedicated to working together with our many partners within FHWA and in State, local, and tribal governments; industry; academia; and others to provide the Nation with safe, secure, reliable, and efficient highway bridges and tunnels. With about 600,000 bridges and 600 tunnels across the country, it is vitally important for us to protect, maintain, and preserve these structures.

FHWA's Office of Bridge Technology has a diversified, motivated, and responsive staff to provide leadership, stewardship, and technical support in successfully delivering the Federal-aid bridge program. Key components of the bridge program include the National Bridge Inspection Program, which encompasses the National Bridge Inspection Standards (NBIS) and the National Bridge Inventory (NBI). The NBIS cover the minimum requirements for inspection programs, including such things as frequency of inspection and minimum qualifications for bridge inspection personnel. The NBI is a compilation of data supplied by States, as required by the NBIS, for bridges located on public roads. FHWA also encourages and promotes the use of a systematic process, such as a Bridge Management System (BMS), in determining cost-effective preventive maintenance activities to extend the service life of existing bridges.

Highway Bridge Replacement and Rehabilitation Program (HBRRP) funds are used to improve the conditions of the Nation's existing bridges, including preventive maintenance to extend the useful life of bridges. Discretionary Bridge Program funds are made available to supplement the HBRRP allocations for the rehabilitation and replacement of high-cost highway bridges, and for the seismic retrofit of highway bridges. The National Historic Covered Bridge Preservation Program, meanwhile, provides funding to assist highway agencies in their efforts to preserve, rehabilitate, or restore historic covered bridges listed in the National Register of Historic Places.

Another key component of FHWA's bridge program is the Innovative Bridge Research and Construction (IBRC) Program. IBRC funds are made available to State and local highway agencies for use of innovative materials and techniques in bridge construction and for research into better bridges. IBRC funds may be used for bridge repair, rehabilitation, and replacement, or for new bridge construction. They may also be used to support research and technology transfer activities.

Technology deployment is another crucial aspect of our office's work. Through publications, workshops, online communities of practice, virtual teams, Web sites, one-on-one consultation, and other means, FHWA is

continued on page 2 ➢

U.S. Department of Transportation

Federal Highway Administration

Better Bridges,
continued from page 1

working to aid States in implementing new technologies that can improve their bridges today and tomorrow. These technologies include the use of self-consolidating concrete (SCC), which does not require vibration to achieve full compaction (see article, page 4). The concrete provides better quality, improved durability, and high strength.

The use of high-performance concrete (HPC) for bridges, meanwhile, has become a standard practice for many States. Bridges built with HPC are expected to last significantly longer than conventional bridges in highway environments, which means less disruptive preservation and maintenance work will be required. The next generation of HPC, known as ultra high-performance concrete (UHPC), is in the final phase of research and development. It offers ultra high strength, toughness, and durability. The implementation of high-performance steel (HPS) is also on the rise, with nearly 40 States now using HPS in over 200 projects. The steel is easier to weld and fabricate, tougher, more corrosion resistant, and has high strength.

Another technology now in use is fiber-reinforced polymer (FRP) composites. FRP has unique properties, such as corrosion resistance, high strength, light weight, and fatigue resistance, which make it very attractive for the strengthening, hardening, repair, and seismic retrofit of bridges and structures. Because FRP behaves quite differently than the conventional structural materials, such as concrete and steel, new American Association of State Highway and Transportation Officials (AASHTO) design codes have to be developed and adopted for FRP to gain wider acceptance by bridge owners.

Also showing promise is ultrasonic impact treatment (UIT) of welds. UIT helps prevent fatigue cracking in welds and welded members of existing and new bridges and structures (see July 2003 *Focus*). Eliminating the fatigue cracking increases the service life and reduces the overall lifetime maintenance cost.

In the area of bridge design, FHWA is working with the States to fully implement the AASHTO Load and Resistance Factor Design (LRFD) system. LRFD is based on technological advances in bridge engineering, sound scientific principles, and a systematic design approach to ensure safety, durability, economy, and constructibility.

In the areas of hydraulics and geotechnical engineering, meanwhile, FHWA is working with the National Highway Institute (NHI) to develop manuals, guidelines, and training courses on such topics as hydrology, hydraulic design, stream stability, scour mitigation, and driven pile foundations.

Strong earthquakes, such as the Loma Prieta Earthquake in 1989 and the Turkey Earthquake in 1999, have taken many lives and caused billions of dollars in damages. The structural engineering community is intensifying efforts to minimize the loss of lives, property, and commerce due to structural failures in future earthquakes. FHWA and the National Cooperative Highway Research Program jointly funded the development of a new seismic design criteria entitled, "Recommended LRFD Guidelines for the Seismic Design of Highway Bridges," for adoption by AASHTO. And under the sponsorship of FHWA, the Multidisciplinary Center for Earthquake Engineering Research is completing a new manual to provide highway agencies with the state-of-the-practice in seismic vulnerability evaluation and retrofit of bridges.

Recognizing the real and growing threats of terrorism against our bridges and tunnels, FHWA, in cooperation with the U.S. Army Corps of Engineers, is

continued on page 8 ➢

FHWA Contacts for Bridges and Tunnels

Raymond McCormick, Team Leader, Bridge Programs, 202-366-4675 (raymond.mccormick@fhwa.dot.gov)

Benjamin Tang, Team Leader, Bridge and Tunnel Technology, 202-366-4592 (benjamin.tang@fhwa.dot.gov)

Jorge Pagan, Team Leader, Hydraulics and Geotechnical Technology, 202-366-4604 (jorge.pagan@fhwa.dot.gov)

Steve Chase, Technical Director for Bridge Research, 202-493-3038 (steve.chase@fhwa.dot.gov)

Hala Elgaaly, Federal Lands Highway Bridge Engineer, 703-404-6232 (hala.elgaaly@fhwa.dot.gov)

Shoukry Elnahal, Structures Technical Service Team Leader, FHWA Resource Center, 410-962-2362 (shoukry.elnahal@fhwa.dot.gov)

Peter Osborn, Hydraulics & Geotechnical Technical Service Team Leader, FHWA Resource Center, 410-962-0702 (email: peter.osborn@fhwa.dot.gov)

Curtis Monk, Chairman of Bridge Leadership Council, FHWA Iowa Division Office, 515-233-7320 (email: curtis.monk@fhwa.dot.gov)

George Romack, Senior Bridge Management Systems Engineer, FHWA Office of Asset Management, 202-366-4606 (email: george.romack@fhwa.dot.gov)

A Virtual Introduction to Segmental Concrete Bridge Technology

Is a segmental concrete bridge right for you? When should highway agencies consider this technology as an economical choice for their bridge construction projects? The Federal Highway Administration's (FHWA) new Segmental Concrete Bridge Technology "virtual" team aims to raise awareness of the technology's unique strengths, as well as its limitations, and to "promote the exchange of best practice insights among government institutions and private industry," says M. Myint Lwin, team co-leader and Director of the Office of Bridge Technology at FHWA.

Team members represent FHWA, State departments of transportation, and industry. Members bring to the table expertise on "project inception, structure concept evaluations, design and construction, and maintenance," notes team member Jerry Potter, Major Bridge Projects Engineer at FHWA. "The team is also working to add members experienced in construction and construction oversight and management," adds Potter.

Segmental concrete bridge technology (SCBT) describes a method of joining numerous cast-in-place or precast bridge elements to form a continuous span. The technique was first used in Europe in the 1950s and began to catch the attention of U.S. designers in the early 1970s. It is now an increasingly popular solution to the engineering challenges posed by deep valley crossings and those in sensitive environments or over wide spans of water. Segmental construction is also useful when interchange ramps (both tangent and curved types) and bypasses must be erected across existing roadways and when performing smaller-scale projects in tight urban spaces without interrupting traffic.

"The key objectives of the team are to accelerate the development of technical expertise and leadership, create innovative and efficient ways to advance technologies, establish a community of practice, and share knowledge and information to improve and advance the segmental concrete bridge technology," says Benjamin Tang, Team Leader in FHWA's Office of Bridge Technology and co-leader of the virtual team.

While there is much accumulated experience on how to address specific engineering and construction challenges that arise in segmental concrete bridge projects, the data have not always been well organized and catalogued for efficient access by bridge designers. To facilitate the dissemination of knowledge within the engineering community and to promote best practices, the virtual team has launched a Web site at www.fhwa.dot.gov/bridge/segmental.

Topics addressed on the Web site to date range from engineering issues, such as the cumulative effects of day-to-day temperature fluctuations on a bridge's structural integrity, to guidance on identifying conditions where segmental concrete structures prove to be more economical than other bridge types. Construction methods are also covered.

The site features a reference library, photo gallery highlighting significant SCBT projects, calendar of upcoming events, and an archive of questions that have been submitted by site users and answered by team members. This "Ask the Experts" feature reflects participation by a range of site visitors, from industry professionals to engineering students.

To learn more about SCBT or the virtual team, visit www.fhwa.dot.gov/bridge/segmental, submit a question to the site's "Ask the Expert" section, or contact Benjamin Tang at FHWA (email: benjamin.tang@fhwa.dot.gov). *

FHWA's Office of Bridge Technology has embraced the concept and value of virtual teams, as it recognizes that there is a wealth of bridge engineering knowledge and expertise available from practicing professionals, industry, and academia that can be used to augment FHWA's in-house expertise. Several virtual teams have therefore been created to provide technical assistance and act as a focal point and clearinghouse on current and forthcoming initiatives, information, and technical materials. Virtual team members contribute their time and efforts on a voluntary basis.

Other structural virtual teams that have been established to date include ones for high-performance steel, seismic engineering, high-performance concrete (see September 2003 *Focus*), tunnels, high strength bolts, and fiber-reinforced polymers. To learn more, visit the following Web sites. Additional virtual teams are in the works, including those for cable-stay bridges, load and resistance factor design, accelerated bridge construction, and bridge monitoring.

Fiber-Reinforced Polymer Composites—www.fhwa.dot.gov/bridge/frp/index.htm

High-Performance Steel—www.fhwa.dot.gov/bridge/hps.htm

High Strength Bolts—www.fhwa.dot.gov/bridge/bolts.htm

Seismic Technology—www.fhwa.dot.gov/bridge/seismic/index.htm

Road Tunnels—www.fhwa.dot.gov/bridge/tunnel/index.htm

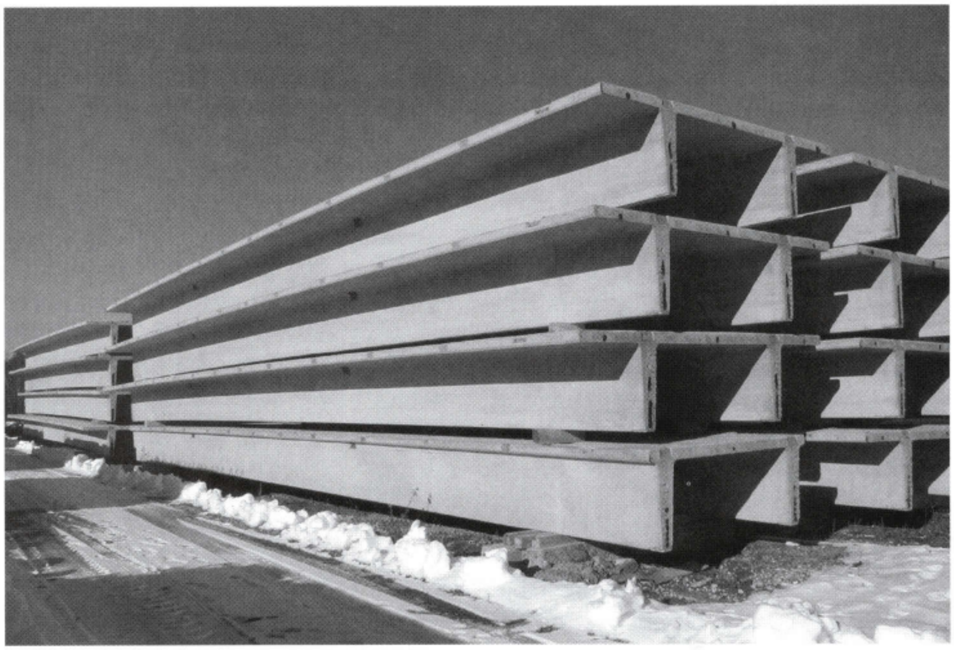
High-Performance Concrete—knowledge.fhwa.dot.gov/cops/hpcx.nsf/home

The Concrete of the Future

Less construction noise and better workability. Improved quality and durability. Faster construction and higher strength. The use of self-consolidating concrete (SCC) in highway construction offers these benefits and more, with the potential for broad structural applications in the United States.

SCC, which does not require vibration to achieve full compaction, was first developed and used in Japan in the early 1990s for bridge building and tunnel construction. An SCC mix has a high degree of workability and remains stable both during and after placement. SCC uses common ingredients, plus superplasticizers and viscosity modifiers. The mix must meet three key property requirements:

- Ability to flow into and completely fill intricate and complex forms under its own weight.
- Ability to pass through and bond to reinforcement material under its own weight.
- High resistance to aggregate segregation.



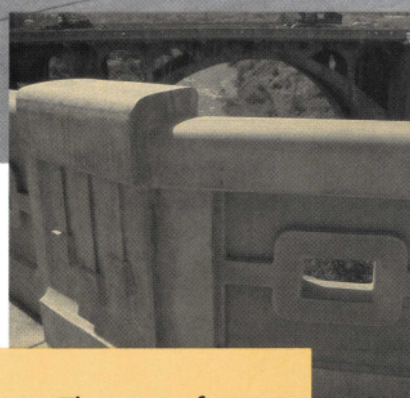
This photo shows Double-T beams constructed using SCC.

Eliminating vibration cuts down on the labor needed and speeds up construction, resulting in cost savings and less traffic disruption. It also reduces the noise level in concrete plants and at construction sites and reduces aggregate segregation, honey combing, and voids in the concrete. The overall concrete quality is improved, as problems associated with vibration, such as under vibration, over vibration, or damage to the air void structure, are eliminated. Also improved is the concrete's resistance to chloride intrusion and ability to withstand freeze thaw damages.

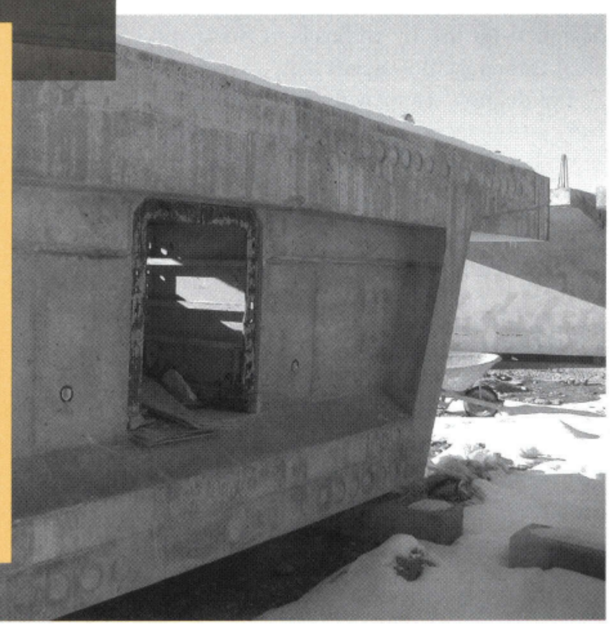
Several European countries formed a consortium in 1996 to develop SCC for practical applications in Europe. Over the past 5 years, SCC bridges and structures have been constructed in such countries as the Netherlands, Sweden, and the United Kingdom. For example, SCC has been used on the Sodra Lanken project in Stockholm, which is the largest ongoing infrastructure project in Sweden. The project will provide a 6-km (3.7-mi) four-lane link from west to east in the southern part of the city. It includes seven major junctions, with bridges, earth retention walls, tunnel entrances, and concrete box tunnels. Begun in 1998, the project is slated to wrap up in 2004.

SCC has primarily been used for parts of the Sodra Lanken construction that are difficult to compact by the normal vibration method, including rock tunnel entrances, retention walls, and underground installation structures. For example, two of the project's parallel tunnels did not have a full rock cover. To stabilize the tunnels and achieve a strong and solid structure, concrete arches were constructed with SCC. The wall sections of the arches were 5-m (16-ft) high, 9- to 16-m (29- to 52-ft) long, and 0.8-m (2.6-ft) thick. The concrete was pumped through a 12.7-cm (5-in) steel pipe from a mobile concrete pump. To ensure an almost continuous flow of concrete into the formwork, two agitating trucks standing side by side to each other discharged the SCC mix. In comparison with other arches cast using conventional techniques, the SCC ones were judged to be of better quality, with good surface evenness and finish that did not require any repairs for rock pockets or other surface defects.

Lessons learned from SCC projects in Japan and Europe include the understanding that the production of SCC requires more experience and care than that of conventional vibrated concrete. Although most common concrete ingredients and mixers can be used for producing SCC, mixes must be properly designed and tested to assure compliance with the project specifications. All commonly used formwork materials are suitable for SCC; However, during cold weather placement of the concrete, it may be necessary to insulate the formwork to maintain the



The photos above and at left show an SCC bridge railing constructed in Spokane, Washington. Below is an SCC box segment.



The use of self-consolidating concrete (SCC) in highway construction offers numerous benefits, with the potential for broad structural applications in the United States.

temperature and normal setting time. SCC is more sensitive to temperature during the hardening process than vibrated concrete. SCC also tends to dry faster than conventional vibrated concrete, as there is little or no water near the concrete surface. The concrete should be cured as soon as practical after placement to prevent surface shrinkage cracking.

The initial cost of SCC may be higher than that of conventional concrete because of the admixtures used. However, when used in Japan and Europe, material cost increases of about 4 percent were offset by labor cost decreases of 33 percent, for a total cost decrease of about 7 percent per project.

"SCC has high potential for greater acceptance and wider applications in highway bridge construction," says M. Myint Lwin, Director of the Office of Bridge Technology at the Federal Highway Administration (FHWA). A new National Cooperative Highway Research Program project will focus on developing design and construction specifications for SCC to supplement the American Association of State Highway and Transportation Officials' Load and Resistance Factor Design specifications. The South Carolina Department of Transportation, meanwhile, has received an Innovative Bridge Research and Construction (IBRC) grant from FHWA to study the use of SCC in drilled shafts. The Kansas Department of Transportation (KSDOT) has also received an IBRC grant to study the use of SCC in prestressed concrete bridge girders. KSDOT will build a three-span bridge, using SCC in all of the prestressed concrete girders for one of the spans, with the other spans being constructed using Kansas's standard concrete mixes. The bridge's performance will then be monitored for 5 years.

More information on SCC is available in the paper, "Applications of SCC in Japan, Europe, and the U.S.," by Masahiro Ouchi, Sada-aki Nakamura, Thomas Osterberg, Sven-Erik Hallberg, and M. Myint Lwin. To obtain a copy or for additional information on SCC and how it is being implemented, contact M. Myint Lwin at 202-366-4589 (email: myint.lwin@fhwa.dot.gov). *

Your Guide to Transportation Asset Management

Strategic management of physical assets, resources, and information is the key to getting the best return on every dollar spent to build and maintain transportation infrastructure. Making these management approaches smarter is the theme that runs throughout the new *Transportation Asset Management Guide* now available from the American Association of State Highway and Transportation Officials (AASHTO). The Guide was developed under National Cooperative Highway Research Program Project 20-24(11).

The Guide looks at how Transportation Asset Management can be applied to an array of highway agency activities and decisions, including program development for capital projects, system preservation, operations, multimodal transportation planning, and real-time and periodic system monitoring. The publication is designed for use by all levels of State and local transportation agencies.

Guidebook users will find the framework and principles of Asset Management, as well as information on how to develop a strategy for implementing Asset Management. The publication organizes the principles and best practices of Asset Management into four key areas: policy goals and objectives, planning and programming, program delivery, and information and analysis. An objectives matrix looks at the relationship between Asset Management and policy: How do Asset Management principles allow policy goals to be formulated more intelligently, and how in turn do established policy objectives affect Asset Management choices? Under the planning area, the Guide looks at how to make the best decisions about resource allocation and infrastructure investments. For example, the Colorado Department of Transportation has defined Program Investment Categories, including safety, mobility, and system quality, that relate directly to transportation policy goals and performance measures. The program delivery section of the Guide, meanwhile, considers various options for best utilizing resources and tailoring management methods. For example, the use of design-build contracting can streamline project planning and save agencies time and money. Finally, the information and analysis section examines the use of information technology to help collect, interpret, and report the data needed to improve the transportation decision-making process. The Virginia Department of Transportation, for example, has developed a comprehensive Inventory and Condition Assessment System to facilitate the management of its highway and road networks. The system uses state-of-the-art automated data collection and global positioning technologies to provide an accurate inventory of transportation system assets and to determine and record their condition.

To help agencies implement Asset Management guidelines in ways that will work best for their circumstances, the Guide also includes a detailed self-assessment tool. The self-assessment enables an agency to answer such questions as:

- How can your agency improve asset performance?
- Are current or planned agency initiatives in infrastructure management sufficient, or do they require modification, addition, or redirection?
- What infrastructure management approaches and techniques have worked well for other agencies?

The Guide has been adopted by the Federal Highway Administration's (FHWA) National Highway Institute as the textbook for a 1-day course aimed at senior- and mid-level executives from transportation agencies (see sidebar). Participants will come away with an understanding of the basics of Asset Management and how they relate to the real-world scenarios that agencies encounter.

You can find the Guide online at downloads.transportation.org/amguide.pdf. For more information, contact David Clawson, Program Director for Policy and Planning at AASHTO, 202-624-5807 (email: davidc@aashto.org), or David Geiger, Director of the Office of Asset Management at FHWA, 202-366-0392 (email: david.r.geiger@fhwa.dot.gov). *

How can transportation agencies manage and preserve the life of their infrastructure and deliver the highest return for the taxpayers' dollars? A new 1-day course available from FHWA's National Highway Institute (NHI), *Transportation Asset Management* (Course No. 131106A), addresses these questions and more as it introduces the principles, techniques, and benefits of Asset Management. The course material is based on the *Transportation Asset Management Guide* now available from AASHTO.

The course presents best practices in the areas of policy development, planning and programming, program delivery, operations, and use of information and analytic tools. It is designed for mid- and senior-level managers from State departments of transportation and other transportation agencies. The course fee is $200 per participant, with a maximum class size of 40.

For information on scheduling the course, contact Danielle Mathis-Lee at NHI, 703-235-0528 (email: danielle.mathis-lee@fhwa.dot.gov). To learn more, visit www.nhi.fhwa.dot.gov/coursedesc.asp?coursenum=1130.

Highway Technology Calendar

The following events provide opportunities to learn more about products and technologies for accelerating infrastructure innovations.

Transportation Research Board 83rd Annual Meeting
January 11–15, 2004, Washington, DC

Transportation professionals from around the world will gather at the meeting to share their knowledge and perspectives on current developments in transportation research, policy, and practice.

Contact: For information, visit the TRB Annual Meeting Web site at www4.nationalacademies.org/trb/annual.nsf.

Making Work Zones Work Better Workshops
January 21–22, 2004, Boise, ID
February 11, 2004, Macon, GA
February 24–25, 2004, Madison, WI
March 11–12, 2004, Charlottesville, VA
March 24–25, 2004, Fargo, ND

The Federal Highway Administration (FHWA), along with State and local partners, is sponsoring this series of workshops to share information on new and emerging technologies and practices for reducing congestion and crashes in and around work zones.

Contact: Carol Keenan at FHWA, 202-366-6993 (email: carol.keenan@fhwa.dot.gov; Web: www.fhwa.dot.gov/workzones).

Fourth National Seismic Conference and Workshop on Bridges and Highways
February 9–11, 2004, Memphis, TN

The conference will provide a forum for exchanging information on current national and regional practices for designing seismic-resistant bridges and highway systems and retrofitting existing structures and highways. An International Forum will feature speakers from various countries that have implemented advanced earthquake design and mitigation technologies and approaches. A Technology Show and Information Display will also showcase innovative technologies for earthquake engineering.

Contact: Wendy Pickering at the University of Illinois, 217-333-2880 (fax: 217-333-9561; email: fourthphseismicconf@ad.uiuc.edu; Web: www.conferences.uiuc.edu/seismic).

Asphalt Pavement Conference 2004: 21st Century Construction
March 15–16, 2004, Nashville, TN

The conference will feature construction practices that are necessary to building hot-mix asphalt pavements that will last. Session topics will include paving and compaction, contracting practices, and plant operations. The conference is being held in conjunction with the World of Asphalt 2004 Show & Conference. Sponsors include the Asphalt Institute, National Asphalt Pavement Association, State Asphalt Pavement Associations, Tennessee Department of Transportation, American Association of State Highway and Transportation Officials, and FHWA.

Contact: For registration information, call 800-355-6635 (fax: 800-979-3365; email: info@worldofasphalt.com) or visit www.worldofasphalt.com.

2004 Concrete Bridge Conference
May 17–18, 2004, Charlotte, NC

The conference will focus on high-performance concrete bridges and rapid bridge construction. The event is sponsored by the National Concrete Bridge Council, Portland Cement Association, and FHWA.

Contact: Shri Bhide at the Portland Cement Association, 847-972-9100 (fax: 847-972-9101; email: sbhide@cement.org; Web: www.nationalconcretebridge.org/cbc/index.html).

First International Symposium on the Design and Construction of Long Lasting Asphalt Pavements
June 7–9, 2004, Auburn, AL

The symposium will facilitate the exchange of information on materials and mix design, construction issues, quality control/quality assurance, contracting methods, perpetual pavements, and other related topics. Sponsors include the International Society for Asphalt Pavements, the Asphalt Alliance, and FHWA.

Contact: National Center for Asphalt Technology, 334-844-6228 (fax: 334-844-6248; email: taplecp@eng.auburn.edu; Web: www.ncat.us (click on "Upcoming Events")).

Structural Materials Technology: NDE/NDT for Highways and Bridges 2004
September 14–17, 2004, Buffalo, NY

Participants will be able to learn about the state-of-the-art in nondestructive evaluation (NDE) and nondestructive testing (NDT) technologies. The event is sponsored by The American Society for Nondestructive Testing, Inc., New York State Department of Transportation (NYSDOT), Transportation Research Board, FHWA, and the Structural Engineering Institute.

Contact: Glenn Washer at FHWA, 202-493-3082 (fax: 202-493-3442; email: glenn.washer@fhwa.dot.gov), or Sreenivas Alampalli at the NYSDOT, 518-457-6827 (email: salampalli@dot.state.ny.us; Web: www.fhwa.dot.gov/bridge/smt.htm).

FOCUS

Focus (ISSN 1060-6637), which is published monthly by the U.S. Department of Transportation's Federal Highway Administration (FHWA), covers the implementation of innovative technologies in all areas of infrastructure.

Its primary mission is twofold: (1) to serve the providers of highway infrastructure with innovations and support to improve the quality, safety, and service of our roads and bridges; and (2) to help promote and market programs and projects of the various offices of FHWA's Office of Infrastructure.

FHWA Administrator: Mary E. Peters

Managing Editor: Zachary Ellis
Tel: 202-493-3193 (fax: 202-493-3475)
zac.ellis@fhwa.dot.gov

Editor: Lisa Pope
Tel: 202-234-7157 (fax: 202-347-6938)
lgpope@woodwardcom.com

Federal Highway Administration (HRTS)
6300 Georgetown Pike
McLean, VA 22101-2296

Publication No. FHWA-HRT-04-021
HIF-1/12-03(11M)E

Send address corrections to:
Woodward Communications
1420 N St., NW, Suite 102
Washington, DC 20005
fax: 202-347-6938
email: lgpope@woodwardcom.com

Better Bridges,
continued from page 2

sponsoring and conducting workshops on Bridge and Tunnel Security Vulnerability for Federal and State personnel. Among other measures, FHWA has formed an Engineering Assessment Team for Bridge Security and Vulnerability to provide technical advice and field review on methods to prevent, mitigate, respond to, and recover from extreme events. The team will also provide training and technical support to infrastructure owners for risk assessments.

Within FHWA, the Office of Bridge Technology is working closely with the Office of Research and Development, the Federal Lands Highway Office, the Resource Center, and the Division Offices to deliver quality services and information to our customers. We have also formed a Bridge Leadership Council (BLC). The BLC, which includes representatives from throughout FHWA, is focused on better linking the agency's resources to streamline the development, testing, and deployment of new technologies and to provide technical assistance to State and other highway agencies.

The success of our many initiatives to advance the safety, security, reliability, and efficiency of the Nation's bridges and tunnels and ensure mobility depends upon strong partnerships. Working cooperatively with our many stakeholders, partners, and customers, we can strengthen and improve the bridges and tunnels of today and tomorrow.

As Director of the FHWA Office of Bridge Technology, I personally invite readers to send your ideas and suggestions for continuous improvement in bridge programs and technologies to me or to your local FHWA Division Office. I value your ideas and suggestions and will consider them as we refine our plans and programs. I also invite you to join the FHWA Bridge Team in achieving the high-quality bridges and tunnels so important to our mobile Nation's transportation network and ultimately to its everyday safety and security. For more information on bridge programs and new bridge technologies, please call me at 202-366-4589 (email: myint.lwin@fhwa.dot.gov) or contact any of our team leaders and partners listed in the sidebar on page 2. *

M. Myint Lwin is the Director of FHWA's Office of Bridge Technology.

U.S. Department
of Transportation

Federal Highway Administration

6300 Georgetown Pike
McLean, VA 22101

Official Business
Penalty for Private Use $300

FIRST CLASS MAIL
POSTAGE AND FEES PAID
FEDERAL HIGHWAY
ADMINISTRATION
PERMIT NO. G-66